SOME RELATIONSHIPS OF THE VARIABLE, CASH EXPENDITURE FOR FARM FAMILY LIVING.

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Mimeograph Bulletin No. 36

Columbus, Ohio.
April, 1931.

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* This bulletin reports certain of the more technical aspects of a study entitled, "Family Living on Selected Ohio Farms; An Analysis of Expenditures for Living and Other Related Factors, Based upon 187 Account Book Records." A non-technical bulletin based on the findings of the study has been issued as Bulletin 468 of the Ohio Agricultural Experiment Station, entitled, "Family Living Expenditures on Ohio Farms." The reader should refer to this bulletin for summary of method and background data. The study was also submitted as a thesis to the Graduate Faculty of the University of Minnesota in partial fulfillment of the requirements for the degree of Doctor of Philosophy.

I. Relation of Cash Expenditure for Family Living to Certain Other Variable Factors.

Among the various printed studies of farm family living in the United States, a number of objectives are discernible:

(1) Some studies have been made merely for the purpose of determining the amount of cash spent by the farm family for living purposes and the amount of materials contributed to family living by the home farm.(1) Such studies have been generally called "cost of living" studies.

(2) Comparison of rural family living with urban family living, with particular emphasis upon a comparison of budgetary categories, has been an important objective in a number of studies.(2) The investigators have attempted to reduce rural living to some system of more or less comparable measures, commonly dollars, for the purpose of obtaining a comparative view of farm life. These attempts have been none too successful because of the extreme difficulty of reducing certain important aspects of farm and urban living to comparable terms.

(3) A third objective has been that of determining the internal laws of budgetary organization and variation. Practically all of the so-called rural standards of living studies have worked toward this objective.(3) The various budgetary categories are analyzed with reference to each other and to the total budget.

(4) A fourth objective is that of explaining the budgetary behavior of families in terms of associated, non-budgetary variables. Such factors as income, capital, schooling of the family members, reading matter utilized, etc., are correlated with the budget and its categories. Many studies have utilized this objective to a greater or less extent; it has served apparently as the major objective in certain studies.(4) Following the methods of urban studies, these

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(1) Examples of such studies are Peck, F. W., The Cost of Living on Minnesota Farms - 1905-1914. Minn. Agri. Exp. Station, Bul. 162. Johnson, O. R., Costs of Family Living on the Farm. Missouri Agri. Exp. Station, Bul. 213. Rankin, J. O., Cost of Feeding the Nebraska Farm Family. Nebr. Agri. Exp. Station, Bul. 219. Hawthorn, H. W., The Family Living from the Farm. U. S. D. A., Dept. Bul. 1338.

(2) Examples of these studies are Kirkpatrick, E. L., The Farmer's Standard of Living, U. S. D. A., Dept. Bul. 1466. Von Tungeln, G. H. and Others, Cost of Living on Iowa Farms. Iowa Agri. Exp. Station, Bul. 237. Zimmerman, C. C., Family Living on Successful Minnesota Farms. Minn. Agri. Exp. Station, Bul. 240. The objective is implicit in many other studies.

(3) See especially Anderson, W. A., Farm Family Living Among White Owner and Tenant Operators in Wake County, North Carolina. N. C. Agri. Exp. Station, Bul. 269, and Factors Influencing Living Conditions of White Owner and Tenant Farmers in Wake County. N. C. Agri. Exp. Station, Techn. Bul. No. 37, by the same author.

(4) See especially Kirkpatrick, E. L., The Standard of Life in A Typical Section of Diversified Farming. Cornell Agri. Exp. Station, Bul. 423; Kirkpatrick, E. L., The Relation Between the Ability to Pay and the Standard of Living Among Farmers. U. S. D. A., Dept. Bul. 1382; Thaden, J. F., Standard of Living on Iowa Farms. Iowa Agri. Exp. Station, Bul. 238; Zimmerman, C. C., and Black, J. D., Factors Affecting Expenditures of Farm Family Incomes in Minnesota, Minn. Agri. Exp. Station, Bul. 246.

attempts have seldom gone beyond the simple sorting or budgetary data on one variable, or coefficients of simple correlation. Kirkpatrick[5] has attempted to remove, or hold constant, the factors of family size and composition (number, age and sex) by developing empirical scales of consumption requirements for individuals. These have been developed for all of the major budgetary categories. Zimmerman[6] has used the simpler method of removing these factors by reducing the total budget to food adult equivalents.

Kirkpatrick has also attempted to reduce the totality of family living to one composite index by the arbitrarily weighted score card method.[7] None of the correlations so obtained were high.[8] It would seem, if one may reason by analogy from the work of the farm business analysts, that such a method is likely to produce less fruitful results than a detailed analysis of the relationships existing among the numerous items and variables which go to make up the socio-economic complex called family living.[9]

This analysis of account book and survey data tends in the direction of the fourth objective mentioned above. It is believed that family living in its totality is influenced by a large number of variable factors and contingent circumstances. These should be studied carefully in their relationships to one another

Relation of Total Receipts to Farm Expense and Family Living.[10]

As total cash receipts increased all major types of cash expenditure for living also increased, until receipts reached a level of $4500-$5000, after which expenditure for living tended to become constant.

When the major budgetary categories were grouped so as to correspond roughly to the so-called "physiological" and "non-physiological" types of expenditure, it was found that both increased at approximately the same rate as total cash receipts increased. Table I gives the rates of increase of these categories and the percentage each is of the total living expenditure. The so-called "physiological" expenditure includes those for food, clothing, operation goods, furnishings and equipment, and health. These data bear out Zimmerman's conclusion

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(5) op. cit., pp. 14-15.
(6) op. cit., pp. 16 ff.
(7) Kirkpatrick, E. L., The Standard of Life in a Typical Section of Diversified Farming, pp. 49 ff.
(8) Evidently the correlations so obtained were considerably affected by the low reliability of the score card. Through the courtesy of Dr. Kirkpatrick, the writer had the privilege of examining 100 copies of the original scores. It was found that, due to the lack of variation in the scores of the education factor which accounted for 300 points in a total of 1000 points, the reliability of the score was only .228. When the education factor was omitted from the list, however, the reliability of the remaining items of the score was .783. Since the reliability of a score card should be as much as .9, it is evident that Kirkpatrick's score, as he used it, was faulty.
(9) cf. Zimmerman, C. C., "Objectives and Methods in Rural Living Studies." Jl. of Farm Economics, Vol. IX, pp. 233 ff.
(10) In order to avoid repetition, much of this section is omitted here. The reader is referred to Bul. 468 of the Ohio Agri. Exp. Station, pp. 26-30, for both text and tables.

that competition between "physiological" and "non-physiological" types of expenditure (or as it is often expressed, between necessities and comforts, or living essentials and "advancement") "is a secondary matter in farm budgets."(11) Such competition does not appear to be present in these data.

Table I.- Relative Increase of Expenditures for "Physiological"* and "Non-Physiological" Purposes, by Total Cash Receipts.

Total Cash Receipt Groups	"Physiological" Expenditure		"Non-Physiological" Expenditure	
	Rate of Increase	Per cent of total living expenditure	Rate of Increase	Per cent of total living expenditure
Under $1000	100	67	100	33
1000 - 1999	117	65	172	35
2000 - 2999	136	67	137	33
3000 - 3999	153	70	134	30
4000 - 4999	184	70	163	30
5000 - 6999	209	59	292	41
7000 - 9999	209	63	252	37
10000 & over	260	67	262	33
Total Average	151	66	154	34

*Includes expenditures for food, clothing, operation goods, furnishings and equipment and health. "Non-Physiological" includes the remainder of the budget.

It has been stated, that as far as farm families are concerned, the primary competition is between living expenditures and land investment expenditures.(12) It would be truer to say between living expenditures and investment expenditures, for many farmers are now investing in forms of income property other than land. This is to be noted in the group under consideration. But it may be questioned whether this statement is unqualifiedly true. In the lower cash receipts groups investment funds disappear and the primary competition occurs between living expenditures and farm operating expense. Apparently under these circumstances family living becomes the more resistant. Farm expense falls below living expense(13) and, if necessary, reserve capital is utilized for living, or bills are unpaid in anticipation of future receipts, or more supplementary receipts from outside sources are sought. If bills are left unpaid it

(11) op. cit., p. 28.

(12) Explanation of the difference in the behavior of the physiological and non-physiological types of expenditure when sorted on total cash receipts and when sorted on total expenditure for living lies in the fact that size of family is not correlated with receipts and total expenditure for living only imperfectly so.

(13) cf. Anderson, W. A., op. cit., pp. 44, 48. Ninety-six per cent of the tenants reported no investments. Kirkpatrick, E. L., and Hawthorne, H. W., Sources and Uses of Income Among 300 Farm Families of Vinton, Jackson and Meigs Counties, Ohio, 1926, pp. 2-3. There were no investments and farm expense did not exceed living expense until total cash receipts reached $1500.

matters little whether the items come under the head of farm expense or family living. The records under consideration show both methods in use. The family must live even though working capital is reduced and debts accumulated. There are minimum standards of respectability and independence to maintain.(14) There is little or no surplus funds for investment, and the family is less interested in investments, or in increasing the size of the farm business, than in hanging on and meeting the necessary farm expenses without reducing working capital.

The relative size of this low receipt group of farmers who have no investment funds is unknown. Zimmerman(15) found that 11 per cent of the farmers studied in Minnesota during 1926 had receipts under $1000. Anderson(16) in North Carolina, in 1926, found that 67 per cent of the farmers of Wake County had total cash receipts under $1000. A composite distribution of the results of several studies(17) in Ohio between 1926 and 1928 showed 24 per cent to have total cash receipts under $1000. Wertz(18) found that the mean gross receipts from agriculture in Ohio for the five year period, 1924-1928, amounted to $1424, and the mean farm expense (not including interest) was $754. Since a distribution of this sort is skewed toward the lower end, it is a certainty that more than half of the farmers of Ohio had total farm receipts of less than that amount, assuming Wertz's calculations to be correct. If 20 per cent of the farm receipts be added for non-agricultural receipts,(19) the mean total would amount to $1780 with the median something less than that amount. It would appear to be a conservative estimate, therefore, to say that about 20 per cent of the farm families of Ohio have total cash receipts of less than $1000 per year. Consequently, if the above argument is correct, competition between living expenditures and investment expenditures does not occur among the 20 per cent of the Ohio farm families who have lowest total cash receipts.

As total cash receipts mount, expenditures for both farm and living increase and investment funds appear. Ultimately both farm expense and investment funds become greater than living expenditures. In the data under consideration farm expense exceeded living expense when total cash receipts amounted to

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(14) cf. Williams, J. M., An American Town, pp. 34-44. The neighborhood conditions described here have largely disappeared but many of the population traits of that period still survive.

(15) op. cit., p. 8.

(16) op. cit., p. 25.

(17) Taken partly from farm account books and partly from family living studies.

(18) Wertz, V. R., Estimated Income from the Ohio Agricultural Industry. Ohio Agri. Exp. Station, Bul. 450.

(19) The proportion of receipts from non-agricultural sources is unknown. It evidently varies greatly in different sections and in different income groups. The Ohio population movement survey of 1063 farms showed that 16 per cent of the families had supplementary sources of income. Kirkpatrick and Hawthorne found that 29 per cent of total cash receipts, among the low income farmers of Jackson, Meigs and Vinton counties, was not obtained from farm operations. Apparently the percentage is higher among low income farmers than among farmers as a whole. Mr. R. Moore, of the Ohio Agricultural Experiment Station found that of 937 farms keeping financial records for 1924-1927, 16 per cent had receipts so low that the abnormally high percentage paid for taxes threw them distinctly out of line with the group as a whole. (Unpublished data).

about $3000, and investment funds exceeded living expense when total cash receipts amounted to about $4500. Zimmerman(20) found these points to be about $2750 and $4250, respectively. They evidently vary in place and probably in time, but it can be said with considerable certainty that they exist. Further study of these points is needed.

The fact that family living expenditures tend to become constant after total cash receipts reach the neighborhood of $5000 is significant.(21) In the first place such budgetary behavior reveals the upper limits of the conventional class standards of rural living. While economic differentiation has introduced class distinctions into the farm population, there still exists a degree of homogeneity and personal democracy which cannot be duplicated in any other similarly large body of the population. These class factors serve as checks upon high expenditures for family living. The result is that high income families increasingly turn their funds into investment channels rather than spend them upon family living. There is no higher expenditure class into which such families may pass and still remain farmers. In the city they would merely pass into a higher expenditure class and increase their living expenditures.

In the second place such budgetary behavior reveals the consumption limitations of the rural environment. The urban environment offers opportunity for almost limitless expenditure for cultural development and conspicuous consumption. The rural environment is, at present, definitely limited in these respects. The farmer who is able to spend $1500 cash per year on family living is the aristocrat of his class in the sense that he may enjoy most of what his environment affords. It is not too much to say that as the farmer's standard of living must certainly be increased by raising the income of the low receipt groups, it may be raised also by enriching the rural environment, thereby making it possible for well-to-do farmers to extend the upper limits of the prevailing rural standards of living.

Relation of Food and Fuel Furnished to Total Receipts.-- (See Bul. 468. pp. 30-31)

Relation of Size of Family to Receipts and Living Expenditure.

In the analysis of the relation of size of family to expenditure for living and other living factors, one of three general methods is usually employed. These are: (1) Avoid the problem by selecting "standard" or similarly composed families; (2) simple sorting or correlation analysis using size of family or household as a variable either in terms of number of persons or some other unit such as adult equivalents; (3) holding the size of family or household, including age and sex composition, relatively constant by means of reducing expenditure to some unit basis, usually some form of per capita or adult equivalent. The first method is, of course, unsatisfactory because it necessitates dealing with a group selected with respect to size of family. Either the second or third methods are satisfactory provided the proper units of measure are devised and applied. Two major difficulties are apparent. One is the difficulty of obtaining a unit scale which will reflect accurately the age and sex composition of the family with respect to expenditure for any purpose such as food.

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(20) op. cit., p. 14.
(21) cf. Lively, op. cit., p. 28, Zimmerman, op. cit., pp. 14-15, Anderson, op. cit., pp. 53 ff.

The other is the difficulty of obtaining a scale, or set of scales, which will allow accurately for variation in the number, age and sex requirements with respect to the various types of expenditure found in the budget.(22) The development of scales for food consumption has progressed much farther than the development of scales for clothing, housing, recreation, etc. One investigator has concluded that at present the food consumption scales are the only ones sufficiently accurate to be used.(23) Kirkpatrick has devised an empirical scale of adult equivalents for each major budgetary category. He believes, however, that they are less satisfactory for food, rent, operating expense, and personal goods than for other budgetary categories.(24)

In the present study more than one method was employed in order to obtain the most satisfactory measure. The purchased budget was obtained in terms of cost-consumption units (Kirkpatrick scales) and also in terms of adult-male equivalents for food.(25) The resulting unit expenditures obtained by use of the two scales were correlated, and the coefficient obtained was .73, Er = .035. Since this correlation is not high enough so that interchangeability of these measures may be assumed, the question becomes one of which is the better measure of size and family, when considered from the standpoint of predicting cash expenditure for living. When considering a multiple variable problem, it is desirable to obtain independent variables which (1) are highly correlated with the dependent variable, and (2) have as low inter-correlation among themselves as possible. Taking cash expended for living as the dependent variable and total cash receipts and size of household as the independent variables, it was found that, for the 179 cases under consideration, the correlation coefficients were as follows:

	Simple r	Partial r
Purchased Budget (X_o) and Total Cash Receipts (X_1)	.469 E_r = .058	.488 E_r = .057
Purchased Budget (X_o) and Adult Male Equivalents, Food (X_2)	.457 E_r = .059	.477 E_r = .058
Total Cash Receipts (X_1) and Adult Male Equivalents, Food (X_2)	.078 E_r = .074	-.173 E_r = .073

$R_{o.12}$ = .631 E_r = .045

It will be noted from these coefficients that total cash receipts and adult male equivalents for food were correlated significantly with the purchased budget, and that total cash receipts and adult male equivalents for food were not correlated. Therefore, since these two independent variables had practically a zero correlation, within the limits of error, the cost-consumption measure (Kirkpatrick scales) could not have a lower correlation with receipts, although it

(22) See discussion of various scales in Kirkpatrick, E. L., The Standard of Life in a Typical Section of Diversified Farming. Cornell Agri. Exp. Station, Bul. 423, pp. 43-46. The scale here used was later modified by the use of larger numbers. See the Relation Between the Ability to Pay and the Standard of Living Among Farmers. U. S. D. A., Dept. Bul. 1382, pp. 12-15.

(23) Zimmerman, op. cit., p. 16.

(24) Kirkpatrick, Ibid, pp. 12-17.

(25) The actual computation of these units was done by H. McKaye and M. Brown of the Dept. of Home Economics.

might be correlated more highly with the purchased budget. As a matter of fact, however, when the purchased budget expressed in terms of cost-consumption units was correlated with receipts it produced a coefficient of approximately the same value (.41, E_r = .062) as that produced by correlating total cash expenditure with total cash receipts (.47, E_r = .058). But when cash expenditure for living per adult male equivalent for food was correlated with total cash receipts per adult male equivalent for food the coefficient was .60, E_r = .048. This tended to verify the multiple coefficient previously obtained. Hence, it appears that, for the data in question, the adult male equivalent for food was a better measure of size of household than the Kirkpatrick scales of cost-consumption units. That is, when considered from the point of view of predicting cash expenditure for living.(26)

Table II gives a comparison of cash expenditure for living when measured by these two methods and the relation of both to total cash receipts.(27) It may be noted that the expenditure per cost-consumption unit was always greater than

Table II.- Comparison of Cash Expenditure for Living When Measured in Terms of Adult Male Equivalents (Food) and Cost-Consumption Units, and Their Relation to Total Cash Receipts

Total Cash Receipts per Adult Male Equivalent (Food)	Number of Cases	Mean Total Cash Expenditure Per Adult Male Equivalent (Food)		Mean Total Cash Expenditure per Cost-Consumption Unit	
		Amount	Rate of Increase Lowest Group= 100	Amount	Rate of Increase Lowest Group= 100
Under $300	11	175	100	252	100
300 - 599	59	232	133	305	121
600 - 899	52	239	137	317	126
900 - 1,199	29	287	164	401	159
1,200 - 1,499	10	320	183	420	167
1,500 - 1,799	6	308	176	367	146
1,800 - 2,099	3	425	243	458	182
2,100 - 2,399	0	---	---	---	---
2,400 - 2,699	4	312	178	437	173
2,700 - 2,999	1	475	271	525	208
3,000 - 3,299	2	500	286	600	238
3,300 - 3,599	0	---	---	---	---
3,600 - 3,899	0	---	---	---	---
3,900 - 4,199	1	475	271	525	208
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13,200 - 13,599	1	725	414	725	288
Total	179	261	149	343	136

(26) One or two reasons for this may be hazarded. The Kirkpatrick scales were found difficult to apply to these data, partly because of lack of clarity in their expression and partly because of the rather detailed manner in which it was attempted to apply them. In case of family members who were absent parts of the year, as well as in case of other irregularities, it became difficult to fix the proper household size index. The adult male equivalent food scale could be applied much more accurately.

(27) Since total cash receipts and adult male equivalents are not correlated, reduction of the former to receipts per adult male equivalent does not alter the result. The zero correlation was discovered after the reductions had been made.

expenditure per food adult male equivalent. This was due to the fact that the household size index for food was generally larger than the index for other types of expenditure. It may also be noted that while expenditure increased much more slowly than receipts, by whichever method used, expenditure per adult male equivalent increased at a more rapid rate than expenditure per cost consumption unit. Expenditure per adult male equivalent was, therefore, correlated more closely with receipts.

Relation of Value of Food and Fuel Furnished per Adult Male Equivalent to Cash Expenditure for Living per Adult Male Equivalent.

When the value of food and fuel furnished was reduced to adult male equivalents and related to cash expenditure for living per adult male equivalent there was virtually a zero correlation. Table III indicates this relationship. While food and fuel furnished increased more than 10 times, the amount of cash spent increased only 1.3 times. From the standpoint of its utility in predicting cash expenditure, therefore, the value of food and fuel furnished was of no value, when size of household was held constant. In fact these two factors showed so little relation to each other that they may be treated much more accurately as two independent variables than when combined as one complex variable as is so frequently done in studies of this sort.(28)

Table III.- Relation of Food and Fuel Furnished per Adult Male Equivalent to Total Cash Expenditure for Living per Adult Male Equivalent

Value of Food and Fuel Furnished Per Adult Male Equivalent	Number of Cases	Total Cash Expenditure per Adult Male Equivalent
$10 - $19	1	225
20 - 29	2	275
30 - 39	4	238
40 - 49	21	289
50 - 59	23	249
60 - 69	35	259
70 - 79	29	254
80 - 89	20	238
90 - 99	14	257
100 - 109	8	294
110 - 119	10	280
120 - 129	5	275
130 - 139	2	225
140 - 149	3	292
150 - 159	2	275
Total	179	261

(28) Subsequent analysis showed that size of family and amount of labor performed by members of the family upon domestic industry were adequate to explain approximately one-half of the variation in value of food and fuel furnished.

Relation of Total Capital to Cash Spent for Living. It would seem reasonable that the total capital possessed by the farmer would show some relation to his cash expenditure for living. Kirkpatrick[29] obtained a correlation coefficient of .48 for owners and .51 for owners and renters combined, when expenditure was expressed in terms of cost-consumption units. Practically the same coefficient (.46) was obtained for the data used in this study, when expenditure and capital were both expressed in terms of adult male equivalents. Capital possessed was significantly related to cash expenditure for living. The remaining question is whether capital possessed was sufficiently independent of cash receipts to contribute anything more toward a prediction of cash expenditure for living. Analysis of the data showed that capital per adult male equivalent was correlated with total cash receipts per adult male equivalent to the extent of .76. Hence, it could not be expected that capital would add much to the predictive value of total receipts. And it did not. The coefficient of multiple correlation obtained was .60 which was no larger than the coefficient obtained when receipts alone was used. The coefficients obtained were as follows:

	Simple r	Partial r
Total Cash Expenditure for Living per Adult Male Equivalent (X_o) and Total Cash Receipts per Adult Male Equivalent (X_1)	.60 E_r = .048	.43 E_r = .061
Total Cash Receipts per Adult Male Equivalent (X_1) and Total Capital per Adult Male Equivalent (X_2)	.76 E_r = .032	.68 E_r = .040
Total Cash Expenditure for Living per Adult Male Equivalent (X_o) and Total Capital per Adult Male Equivalent (X_2)	.46 E_r = .059	.01 E_r = .075

$R_{o.12}$ = .60, E_r = .048

Relation of Age of Operator and Homemaker to Cash Expenditure for Living. Analysis of the data of 186 family records showed no significant relation between age of operator and homemaker and cash expended for living. This was true whether age was related to total cash spent or to cash spent per adult male equivalent. It was also true irrespective of whether the age of operator or the average age of operator and homemaker were used. Hence, age of operator and homemaker were of no value in predicting cash expenditure for living.

Relation of Schooling to Cash Expenditure for Living. The relation of schooling to expenditure for living is an important matter. Everywhere one encounters the belief that education in the broad sense has the effect of raising the standard of living. Formal schooling is more easily measured than general education, but its relation to standards of living may be slightly different. Kirkpatrick[30] obtained a correlation of .43 between schooling of operator and homemaker and expenditure per cost-consumption unit. Thaden[31] believed that the extent of the education of the children showed more promise as an index of the family standards of living than any other factor. But the extent to which education influences standards of living independent of ability to pay and the

(29) Kirkpatrick, E. L., The Standard of Life in a Typical Section of Diversified Farming. Cornell Agri. Exp. Station, Bul. 423, p. 116.
(30) Kirkpatrick, E. L., Relation Between the Ability to Pay and the Standard of Living Among Farmers. U. S. D. A., Dept. Bul. 1382, p. 27.
(31) Thaden, J. F., op. cit., p. 107.

extent to which education influences standards of living through increasing the ability to pay is unknown. For discussion purposes the subject may be divided conveniently into two aspects: (1) education of operator and homemaker, and (2) education of the children.

For this analysis no measure of general education was available. The measure used was that of grade in school finished by the various members of the family. When the data were grouped into three broad groups, (1) those having average schooling below high school, (2) those that averaged somewhere in high school and (3) those that averaged somewhere above high school, the relation of schooling to both receipts and expenditure for living was evident.(32) When the three factors were analyzed by the correlation technique, the following coefficients were obtained:

	Simple r	Partial r
Cash Expenditure for living per Adult Male Equivalent (X_o) and Total Cash Receipts per Adult Male Equivalent (X_1)	.60 E_r = .048	.52 E_r = .055
Cash Expenditure for Living per Adult Male Equivalent (X_o) and Average Schooling of Operator and Homemaker (X_2)	.36 E_r = .065	.26 E_r = .070
Total Cash Receipts per Adult Male Equivalent (X_1) and Average Schooling of Operator and Homemaker (X_2)	.27 E_r = .069	.07 E_r = .075

$R_{o.12}$ = .64; Er = .044

It appears to be clear from this analysis that the schooling of operator and homemaker was significantly related to both receipts and expenditure for living, though the correlation was not high in either case. Apparently there was a slightly closer relation between schooling and cash expenditure for living than between schooling and receipts. The fact that schooling was related to both of these factors, however, gave it an insignificant value as an additional index of expenditure for living. That is, from the standpoint of prediction of cash expenditure for living, total cash receipts per adult male equivalent (food) was virtually as good as both receipts and schooling taken together.

It is commonly believed that the education of children exerts important influence upon the behavior and standards of the family. Hence, it is presumed that the education of the children affects the family expenditures for living purposes. This seems reasonable. Schooling, particularly in high school and college costs considerable. The 21 families having one or more children in college averaged $294 per year for educational purposes while the 166 families having no children in college averaged but $60 per year. Furthermore, the total average budgets of these two groups of families differed by $441, a difference greater by $200 than the difference in amounts spent for education. Is this, then, evidence that the families having children in college possessed higher standards of living and therefore spent more cash for living than those who had no children in college? The answer is negative. The families having children in college were sufficiently larger, in terms of adult male equivalents, to account for the entire difference. In fact, when the amounts spent for education, per adult male equivalent, by the two groups, were omitted from the total cash expenditure per adult male equivalent, the remaining budget of the group having no children in college became slightly larger than that of

(32) See Bul. 468, pp. 32-33, for tables.

the families having children in college. Apparently, as far as these families are concerned, having children in college increased cash expenditure for education and also increased total cash expenditure by somewhere near that amount. When size of family was held constant, there was no indication that cash spent for other living purposes was increased while children were in college. The reverse was suggested.

Is there other evidence that the education of children influences the total amount of cash spent for living? The data obtained in this study do not offer such evidence. In the first place, the schooling of the children was related only very slightly to the schooling of the parents. The children of renters appeared to be making as good educational progress as those of owners, as far as they could be compared.(33) This was interpreted to mean that the families in question were all financially able to give their children reasonably good schooling; and that the influence of compulsory school attendance laws and the wide dissimination of the belief in the desirability of an education have more influence in the matter than the schooling of the parents.

In the second place, the average schooling of all children 18 years of age and over showed no relation to the amount of cash spent for living per adult male equivalent. If the higher education of children serves to increase the total cash expenditure for living independently of the extra amount required for their education, it might be assumed that such cash expenditure would be higher in families where children were being or had been well educated. Such did not appear to be the case with the families under consideration.

In the third place, a weighted index(34) of children in school showed no relation to the amount of cash spent for family living per adult male equivalent. Some families with a low index of children in school spent comparatively large sums for living. Children in the grades were sometimes given music lessons which greatly increased expenditure beyond what was necessary for formal schooling. Other families with a high index of children in school spent less for living. Apparently these families economized in other directions in order to give the children the desired amount and kind of education. In some cases the children went partly on their own resources, earned while at school or during the summers. In other cases the children attended schools of college grade located close enough so that they could live at home a part of the time.

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(33) Comparison of families with respect to the education of their children is a difficult matter. For purposes of this study a family index was computed as the ratio of the aggregate number of grades completed by children in school to the aggregate number of grades that would have been completed if all children were up to grade. "Up to grade" was taken as a child of six in the first grade and one grade per year thereafter until the child had finished college at the age of 22. Obviously such an index throws no light upon the distance a child will travel in school. The indices varied from 65 to 109.

(34) The index was constructed on the basis of the following weights: One child in elementary school = 1; one child in high school = 4; and one child in college = 8. The weights were arbitrarily set to approximate the relative costs of schooling children.

Relation of Reading Matter to Cash Expenditure for Living. A number of investigations have found that the amount of reading matter which families keep in their homes is significantly related to various aspects of behavior and expenditure for living. The extent and nature of the reading matter received and perused by families is without doubt some index of the type of life they lead. That is, it is some index of the socio-economic status of the family. But socio-economic status is a broad complex for which no general index is available. In this study we were interested primarily in factors which may serve as indices, not of general socio-economic status, but of the total cash expended for living. The problem, therefore, was one of the relation of reading matter to this cash expenditure and to other significant factors which may also serve as indices.

Reading matter may be divided conveniently into books and periodical literature. For the families under consideration there was a fairly close correlation between the number of newspapers and magazines received and the number of books owned. There was no relation between number of books owned and number of books borrowed from libraries or other sources. Apparently the reading habit is the important family variable, and the number of books and periodicals owned and received varies somewhat accordingly.

The average number of hours per week spent in reading by the operator and homemaker was not related significantly to the number of newspapers and magazines received. The number of hours per week spent reading by operator and homemaker varied from one to seventeen; the average number was 8.4 hours. The greater amount of reading matter in some homes apparently served to increase the variety and possibility of choice rather than to increase the number of hours spent in reading.

The relation of average schooling of operator and homemaker to the number of newspapers and magazines received was slight.(35)

When number of newspapers and magazines received was used as a measure of the reading matter of the family and related to total cash expenditure for living per adult male equivalent, it was found to have a significant relation. The relation of periodicals received to total cash receipts was very low. The relation of periodicals to cash spent for living was not sufficiently high to give the former much validity as an index of the latter, however. The conventional number of magazines received was eight or ten. This concentration about the mean lowered the value of magazines as an index of expenditure for living. The following correlation coefficients were obtained:

	Simple r	Partial r
Total Cash Expenditure for Living per Adult Male Equivalent (X_0) and Total Cash Receipts per Adult Male Equivalent (X_1)	.60 E_r = .048	.61 E_r = .047
Total Cash Expenditure for Living per Adult Male Equivalent (X_0) and Number of Periodicals Received (X_4)	.25 E_r = .070	.24 E_r = .070
Total Cash Receipts per Adult Male Equivalent (X_1) and Number of Periodicals Received (X_4)	.09 E_r = .074	-.07 E_r = .074

$R_{0.14}$ = .63; E_r = .045

(35) The correlation coefficient obtained was .28.

When the average number of hours spent in reading per week by the operator and homemaker was correlated with cash expenditure for living per adult male equivalent, it was found that it was no more closely related to expenditure than the number of papers and magazines received. Hence, the number of hours reading was of no more value as an index of cash expenditure for living than the amount of periodical literature received.

Relation of Conveniences Possessed to Cash Expenditure for Living.

The possession of conveniences was defined arbitrarily as the possession of one or more of the following list: furnace, electric or gas lights, bath, power water supply, indoor toilet, power washing machine, electric iron, electric vacuum cleaner, and telephone. Since practically all families possessed one or more automobiles that item was omitted from the list. The relation of the number of these conveniences possessed to total cash receipts and total cash expenditure for living per adult male equivalent, and to the kitchen score is indicated in Table IV.

The kitchen score card first used was the extension worker's score card published by the Extension Service of the United States Department of Agriculture. It was found, however, that the reliability of this score card was only .51. The score card was accordingly revised and its reliability raised to .80. Since the reliability of such a score card should be as high as .90 the revision is yet imperfect. Nevertheless, the scores of 91 kitchens, based on the revised card, showed a significant correlation with the number of conveniences possessed.

Table IV.- Relation of Number of Conveniences Possessed To Total Cash Receipts and Total Cash Expenditure for Living per Adult Male Equivalent, and to Kitchen Score

Number of Conveniences	Number of Cases	Average Total Cash Receipts per Adult Male Equivalent	Average Total Cash Expenditure for Living per Adult Male Equivalent	Kitchen Score	
				Number of Cases	Average Score
0	1	450	275	1	62
1	27	694	212	15	73
2	22	764	234	11	71
3	21	836	230	7	79
4	15	730	215	7	76
5	24	900	248	11	82
6	24	813	269	13	84
7	15	1690	392	11	87
8	12	750	271	5	83
9	18	1317	331	10	90
Total	179	914	261	91	80

When the number of conveniences possessed was related to total cash expenditure for living per adult male equivalent, it was found that the relationship was a significant one. It was also found that the relationship existing between number of conveniences possessed and total cash receipts per adult male equivalent was sufficiently low so that the number of conveniences possessed some additional value as an index of cash expenditure for living above that possessed by total cash receipts. The following correlation coefficients were obtained:

	Simple r	Partial r
Total Cash Expenditure for Living per Adult Male Equivalent (X_0) and Total Cash Receipts per Adult Male Equivalent (X_1)	.60 E_r = .048	.59 E_r = .049
Total Cash Expenditure for Living per Adult Male Equivalent (X_0) and Number of Conveniences (X_2)	.38 E_r = .066	.35 E_r = .066
Total Cash Receipts per Adult Male Equivalent (X_1) and Number of Conveniences (X_2)	.16 E_r = .073	-.08 E_r = .074

$R_{0.12}$ = .66; Er = .042

Relation of Amount of Money Invested in Furniture to Cash Expenditure for Family Living. When the amount of money invested in furniture was related to total cash expenditure for living per adult male equivalent, it was found that the correlation coefficient (.30) was significant. It was not as high as Kirkpatrick obtained in his New York Study,(36) however. Furthermore, it was found that the amount invested in furniture was correlated sufficiently (.22) with total cash receipts so that this factor possessed little predictive value for cash spent for family living, above that possessed by total cash receipts alone. The coefficient of multiple correlation obtained with total cash expenditure for family living, per adult male equivalent, as the dependent variable (Xo), and total cash receipts per adult male equivalent (X_1) and amount invested in furniture (X_3) as the independent variables was $R_{0.13}$ = .62; Er = .046. Hence, it is clear that in these data the value of furniture was of little value as a predictive factor.

Relation of Organization Relationships to Total Cash Expenditure for Family Living. The extent to which the members of a family are affiliated with and associated with the formally organized organizations and institutions of the community constitutes some measure of the socialization of the family. Presumably the socialization of the family is correlated to some extent with the quantity and quality of goods and services which the family consumes as a part of its family living.(37) No measure of the quality of the goods and services used is here available. Consequently the problem becomes one of the relation

(36) op. cit., p. 117. He obtained a coefficient of .54 when cost-consumption units were used and furnished values included with the purchased budget.

(37) For example, it has been found that the number of organizations to which the family belongs is correlated significantly with the number of books owned and the number of periodicals taken.
See Kirkpatrick, E. L., and Others, Rural Organizations and the Farm Family, Wisc. Agri. Exp. Station, Research Bul. 96, pp. 54-55.

of family socialization as measured in terms of organization relationships to the quantity of cash spent for these goods and services, i.e. for family living.

The method of measuring organization relationships was to develop a family index based upon the organization relationships of all members of the family who were ten years of age or over. The index included membership, attendance, financial contributions and positions of leadership (i.e. officerships) held. The financial contributions for church and organization dues were taken from the family record of expenditures. The other items were collected by the survey method. Each of these four organization relationships were equally weighted.(38) That is, one membership, one attendance and one officership was each put equal to 100. The per family average total cash expenditure for church and organization dues proved to be $56.00. The average number of persons per family 10 years of age and over was 3.41. This gave a per capita contribution of $16.42 per year. This sum was put equal to 100 and each family scored according to how its per capita contribution compared with that sum. That is, each dollar contribution equalled 6.1 points. Of course, a very large percentage of the total family score so constructed is made up of attendance at meetings. This is perhaps as it should be.

The social agencies and organizations included in the index were the church, grange, Farm Bureau, fraternal orders, Parent-Teacher Association, and all miscellaneous clubs such as 4-H Clubs, and organizations auxiliary to church and school.

Table V.- Relation of Organization Index of Total Cash Receipts and Total Cash Expenditure for Family Living

Organization Index	Number of Cases	Total Cash Receipts per Adult Male Equivalent		Total Cash Expenditure for Living per Adult Male Equivalent	
		Average Amount	Rate of Increase: Lowest Group=100	Average Amount	Rate of Increase: Lowest Group=100
Under 1,000	5	510	100	185	100
1,000 - 1,999	3	550	108	158	85
2,000 - 2,999	12	700	137	213	115
3,000 - 3,999	27	917	180	229	124
4,000 - 4,999	23	1193	234	288	156
5,000 - 5,999	25	798	156	265	143
6,000 - 6,999	39	827	162	262	142
7,000 - 7,999	23	946	185	284	154
8,000 - 8,999	12	1225	240	300	162
9,000 - 9,999	3	450	88	158	85
10,000 - 10,999	6	1350	265	358	194
11,000 - 11,999	1	750	147	375	213
Total	179	914	179	261	141

(38) A modification of this score was used by Kirkpatrick and Others in the Wisconsin study previously referred to. See page 12 of that study.

When this index of family organization relationships was correlated with total cash expenditure for living, per adult male equivalent, the coefficient of simple correlation was found to be .26. This is a low but significant correlation. The remaining question was whether this organization index was also related significantly to total cash receipts. It was found that this relationship was low. The coefficient of simple correlation was .06. Table V shows the relation of the organization index to the group means of total receipts and cash spent for living. Evidently the organization index was related much more closely to cash expenditure for living than to total cash receipts. The method of multiple correlation gave the following coefficients:

	Simple r	Partial r
Total Cash Expenditure for Living per Adult Male Equivalent (X_0) and Total Cash Receipts per Adult Male Equivalent (X_1)	.60 E_r = .048	.60 E_r = .049
Total Cash Expenditure for Living per Adult Male Equivalent (X_0) and Organization Index (X_2)	.26 E_r = .064	.27 E_r = .065
Total Cash Receipts per Adult Male Equivalent (X_1) and Organization Index (X_2)	.06 E_r = .073	-.11 E_r = .074

$R_{0.12}$ = .64; E_r = .042

From the results, it may be said that in these data the organization relationships of the family as measured by this index constitute a significant factor, though a slight one, among those which possess predictive value for total cash expenditure for living.

Relation of Play Facilities Possessed to Cash Expenditure for Living. The possession of an arbitrarily selected list of play facilities for children was used as an independent variable and related to total cash expenditure for living, per adult male equivalent. There was no significant correlation. The list of play facilities used was baseball, basket ball, football, tennis, volley ball, croquet, horse shoe, rope swing, porch or lawn swing, hammock, wagon, sled, pony, and other pets. The mean number of these play devices possessed by the families was 4.3.

It should be made clear that this list was selected arbitrarily from those possessed by the families. It was not decided upon a priori. The families were not homogeneous with respect to this factor, however. Some had no children. Some had only grown children who no longer used these play devices and, because of their age, perhaps never did use many of them.

Relation of Labor on Domestic Industry to Cash Expenditure for Living. The extent of the domestic industry which the farm family maintains might conceivably be related to the cash expenditure for living. By domestic industry is meant those home industries such as washing, churning, care of chickens and garden, etc., industries most of which have been lost among city families, but which have an important bearing upon family living among farm families. Such domestic industries might conceivably affect the total cash expenditure for living in at least two ways: (1) by increasing the amount of living content obtained without the expenditure of cash, and (2) by serving as a sort of index of socialization.

The estimated number of hours which the members of the family spent per year working at these home industries was obtained and used as an independent variable.(39) The home industries included were washing, ironing, mending, sewing, baking, churning, boarding farm help, care of milk, care of chickens, care of garden, and care of lawn. This was divided into labor performed by the homemaker(40) and labor performed by other members of the family. The labor performed by the homemaker was further divided into (1) that performed on washing, ironing, mending, sewing, baking, and churning, and (2) that performed on boarding farm help, milking, care of chickens, and care of garden and lawn. Ninety per cent of the labor done on both of these groups of domestic industry was performed by the homemaker. The remainder was performed by the operator or the children. There was no significant correlation between the amounts of labor performed by the homemaker upon these two groups of industry, however. That is to say, that there was only the slightest tendency for the amount of labor performed by the homemaker upon the outdoor group of activities (milking, care of chickens, garden, lawn and boarding farm help) to decrease as the amount of labor she performed upon the indoor group (washing, ironing, mending, sewing, baking and churning) increased. The relationship was quite consistent from one yearly group to another. Apparently, the question as to what domestic industries shall command the major portion of the homemaker's time is settled upon considerations other than whether they belong to the indoor or outdoor group. Common sense, of course, tends to verify this conclusion. Very likely the individual preference of the homemaker together with the particular circumstances surrounding the family are the chief deciding factors.

The total amount of labor performed by all members of the family upon these domestic industries was correlated with the total value of food and fuel furnished by the farm. The coefficient was .37. When both labor and furnished values were reduced to adult male equivalents, however, the correlation was reduced to near zero. It also happened that there was no significant correlation between total labor on domestic industry and the total cash spent for living. Hence, it must be concluded that for these data, labor performed on domestic industry was of little or no value in predicting cash expenditure for living.

Total Predictive Value of the Variables Considered. The major objective of this analysis was that of locating a sufficient number of significant variables outside the cash expenditure budget itself to enable one to predict with some degree of accuracy the total amount of cash which the farm family will spend for living purposes. The problem may be approached in other ways: (1) one may attempt to predict the various individual budgetary categories by the use of internal budgetary factors, such as amounts and proportions spent for various purposes. (2) One may attempt to predict the various individual budgetary categories by use of factors which lie outside the budget. (3) One may attempt to predict the total cash expenditure budget by means of factors which lie without the budget. Then, too, some combination of these three approaches may be

(39) The estimates were obtained in terms of hours per week for a given number of weeks and reduced to a yearly basis.

(40) In a few cases where poultry and dairy were chief sources of farm income and the homemaker contributed much labor it was classed as help with farm work rather than labor on domestic industry.

used.(41) All of these approaches must be exploited before the budgetary relationships of the farm family will be understood.

In this study a long list of possible variables was obtained and each was examined for its predictive value. The more significant of these have been set forth in the preceding pages. In order to keep the analysis simple and clear the number of variables under consideration at one time was kept small. It has been seen that total cash receipts and size of family were the most significant of those treated. But as each significant variable was added the value of their collective influence became more of a question. Hence, the more significant ones were combined into a multiple correlation analysis.(42) The following variables were used:

X_0 = Cash Expenditure for living per adult male equivalent.
X_1 = Total Cash Receipts per Adult Male Equivalent.
X_2 = Average Schooling of Operator and Homemaker.
X_3 = Number of conveniences possessed.
X_4 = Index of Organization Relationships.

Size of family was held constant by means of adult male equivalent scales for food.

	Simple r	E_r		Simple r	E_r
$r_{0.1}$ =	.600	.048	$r_{1.3}$ =	.164	.073
$r_{0.2}$ =	.362	.065	$r_{1.4}$ =	.065	.074
$r_{0.3}$ =	.378	.066	$r_{2.3}$ =	.187	.072
$r_{0.4}$ =	.255	.064	$r_{2.4}$ =	.188	.072
$r_{1.2}$ =	.267	.069	$r_{3.4}$ =	.121	.074

Multiple correlation coefficient: $R_{0.1234} = .70$; $E_r = .053$

The multiple correlation coefficient thus obtained was equal to .70, and accounted for approximately one-half of the total variations of the variable Xo, the total cash expenditure for living per adult male equivalent. No doubt the value of this coefficient could have been raised slightly by the addition of more of the tested variables at hand. It was clear, however, from the low simple correlations of these factors with the purchased budget, and the nature of their inter-correlations that they scarcely would raise the multiple coefficient enough to warrant the extra labor. The solution probably lies in the direction of obtaining new and more significant variables rather than a further summation of relatively insignificant ones.

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(41) Prof. W. A. Anderson used one of these combination approaches and attempted to predict the various individual budgetary categories. He was most successful with the categories of food and fuel, clothing and automobile. See Factors Influencing Living Conditions of White Owner and Tenant Families in Wake County. No. Carolina Agri. Exp. Station, Techn. Bul. 37.

(42) Those variables found to possess little or no predictive value because of high intercorrelations were total capital possessed, value of food and fuel furnished, age of operator and homemaker, schooling of children, reading matter obtained, amount of money invested in furniture, play facilities of children, number of children born, amount of labor on domestic industry and average amount of time spent reading by operator and homemaker.

Apparently the cash expended for family living by the families under consideration was influenced by a considerable number and variety of factors. These families, although many were not even well-to-do, were schooled above the average and were in contact with the world of affairs, both locally and otherwise. For this reason, it might be inferred that, in addition to ability to pay, a greater variety of factors would play a part in determining the size of their purchased budget than would be the case with families whose behavior was more completely conditioned by local circumstances. On the other hand Professor Anderson, working with more cases and with families that evidently were conditioned much more by the local environment, found total cash receipts and schooling to be of less significance in explaining budgetary behavior than was the case in this study. Whether the remaining variation in cash expenditure for living may be accounted for by means of a few significant but undiscovered variables or only by means of a large number of relatively insignificant ones, it is impossible to say. Probably the latter is the better guess.

II. Inter-Yearly and Inter-Family Variations.

Since there were 47 families that kept continuous records for two or more years, some study of inter-yearly variation was possible. It was desirable to know how inter-yearly variation compared with inter-family variation, since multiple records from some families were used in the total summaries. The coefficient of variation, $\frac{\text{Average deviation}}{\text{A. Mean}} \times 100$ was used for this analysis.(43) When computed for variation in total cash receipts the results were as follows:

Variation between years.
V 1926-7 = 11.2; σ_V = 1.5 (27 cases)
V 1927-8 = 17.2; σ_V = 2.0 (37 cases)

Variation between families.
V 1927 = 57.9; σ_V = 6.7 (37 cases)

The variation between years was much lower than the variation between families, in 1927 which was a typical year, but high enough to account for considerable error if one year only was used. Similar results were obtained when variation in cash expenditure for living was considered. The results were as follows:

Variation Between Years.
V 1926-7 = 8.6 σ_V = 1.2 (28 cases)
V 1927-8 = 8.8 σ_V = 1.0 (38 cases)

Variation Between Families.
V 1927 = 33.6 σ_V = 3.5 (47 cases)

Thus, it appears that the variation in cash expended for family living is subject to less variation than total receipts; that the inter-yearly variation in family living expenditure is less than the inter-family variation; and that there appears to be greater stability of inter-yearly variation in family

(43) The average deviation is usually applied to variation within a single frequency distribution. Here it is also applied to variation between two frequency distributions. The formula used was

$$V = \frac{\text{A. D. per family between years}}{\text{A. M. per family for both years.}} \times 100$$

living expenditure than for total receipts.(44)

Apparently the size of the household is likely to vary less from year to year than either receipts or expenditure for living. The coefficients of variation, computed for the same group of families as previously considered, i.e. 28 families for 1926-27 and 38 families for 1927-28, yielded the following results:

Variations between years.

V 1926-7 = 5.6 σ_V = 0.75

V 1927-8 = 4.4 σ_V = 0.50

Variation between families.

V 1927 = 26.2 σ_V = 2.67

The unit of measurement used here for size of household was the adult male equivalent as given by the Hawley(45) food scale for calculating the energy requirements of a family group and used elsewhere in this report. Not only the actual members of the household but all other persons who were members of the household for food purposes for varying lengths of time were included. This latter element increased the variation only slightly, however. Most of the inter-yearly variation may be attributed to variation in hired help and visiting relatives who were members of the household for parts of the year, and to variation in the length of time adult children, who were attending school or working away from home, were included as members of the household.

When inquiry was made into the inter-yearly variations occurring in the various budgetary categories within the cash expenditure budget itself, it was found that food varied approximately the same as total cash expenditure (exclusive of life insurance) while clothing, operating expense, furnishings and equipment, health and advancement (education, recreation, church and benevolences, organization dues and gifts) varied somewhat more than total cash expenditure. The coefficients of variation obtained may be found in Table VI.

Table VI.- Coefficients of Variation of the Major Budgetary Categories Between Years in the Same Families and Between Families the Same Year; for Families Keeping Records for More than One Year

Item	Between Years			Between Families		
	V 1926-7	σ_V	V 1927-8	σ_V	V 1927	σ_V
Total Purchased	8.6	1.2	8.8	1.0	33.6	3.5
Food Purchased	9.2	1.2	8.0	0.9	34.2	3.5
Clothing	17.1	2.3	12.9	1.5	47.3	4.9
Operating Expense (Purchased)	15.5	2.1	13.7	1.6	45.9	4.7
Furnishings and Equipment	44.0	5.9	55.8	6.4	68.6	7.1
Health	45.2	6.0	36.1	4.1	80.9	8.3
Advancement	23.3	3.1	20.1	2.3	69.8	7.2
Total Furnished	8.6	1.2	8.8	1.0	33.6	3.5

(44) According to the Bureau of Agricultural Economics, the variation in the index of prices paid by farmers for commodities used in living for the years in question was almost too slight to be significant. The index was 164 for 1926, 161 for 1927 and 162 for 1928. See The Agricultural Situation, March 1930, p. 17. No comparable index for Ohio is available.

(45) Hawley, E., Dietary Scales and Standards for Measuring A Family's Nutritive Needs. U. S. D. A., Technical Bulletin No. 8, p. 28.

It seems evident from these coefficients that food is the least variable major category in the budget when variation from year to year is considered. When the furnished operating expense was subtracted from the total furnished category, of which it was a small percentage, the inter-yearly variation in furnished food was no greater than that of purchased food.

On the other hand, furnishings, and equipment, health and advancement were the greatest variants. In these budgetary categories expenditure items tend to be small one year and large the next due to an expensive illness, the purchase of furniture or the cost of maintaining one or more children in school.

It is evident also from this table that the variation in budgetary categories from year to year within a group of families is much less than the variation between the families of the same group. The greatest inter-family variation occurred in expenditures for furnishings and equipment, health and advancement, while least variation occurred in the expenditure for food and in the value of food and fuel furnished by the home farm. There were least differences between inter-yearly and inter-family variations in the categories of furnished food and furnished fuel, furnishings and equipment and health. The greatest difference between inter-yearly and inter-family coefficients occurred in food purchased.

III. Methodological Note: The Significance of Using More than One Record from the Same Family. Some of the advantages of having records from the families studied for more than one year have been made apparent in Section II. It remains to inquire how the addition of more records from the same families affects the general results obtained by using but one record from a family. In order to compare the results obtained by both methods the simple correlations between the four variables used in obtaining the final multiple correlation coefficient and the dependent variable were calculated. It will be remembered that those variables were:

X_0 = Total Cash Expenditure for Living per Adult Male Equivalent.
X_1 = Total Cash Receipts per Adult Male Equivalent.
X_2 = Average Schooling of Operator and Homemaker.
X_3 = Number of Conveniences Possessed.
X_4 = Index of Organization Relationships.

The following comparisons illustrate the results:

Variable	Correlation with X_0; 179 Cases, 67 Repeaters			Correlation with X_0; 112 Cases, no Repeaters		
	σ	r	E_r	σ	r	E_r
X_0	1.91	---	---	1.96	---	---
X_1	3.68	.600	.048	2.00	.511	.081
X_2	2.42	.362	.065	2.99	.276	.087
X_3	2.59	.378	.066	2.55	.429	.085
X_4	2.22	.255	.064	2.14	.239	.089

Since there was greater variation between families than from year to year in the same family, with respect to these variables, (See Section II), the effect of adding consecutive yearly records from the same families was to lower the standard deviation. In all of the above cases but one this occurred. That is, the standard deviation was either actually lowered by adding the 67 records of repeating families, or it was not raised proportionally to the number of records added.

In three cases the correlation coefficient was raised and in one case lowered by adding the 67 repeater records. However, the changes in these coefficients were not great enough to place them outside the limits of error. The additional number of cases lowered the standard error of the coefficients, thereby adding to their value.

Hence, it appears from a comparison of the results obtained by these five variables, that the chief effect of adding extra records from the same families, is to lower the standard deviation of the variables. While some slight changes occur in the correlation coefficients, it is questionable whether the changes are great enough to be significant, i.e. beyond the limits of error. The standard error of the correlation coefficients is lowered thereby adding to their precision.